

...JUNE 2013 REGIONAL CLIMATE SUMMARY...

SUMMARY FOR THE SAN FRANCISCO BAY AREA AND MONTEREY BAY AREA...

THERE WERE FOUR NOTABLE WEATHER EVENTS DURING THE MONTH OF JUNE. TWO OF THESE EVENTS WERE HEAT WAVES. THE OTHER TWO EVENTS...A THUNDERSTORM EVENT AND AN ANOMALOUS PRECIPITATION EVENT...PRIMARILY IMPACTED THE NORTH BAY COUNTIES.

A BROAD UPPER RIDGE STRENGTHENED OVER THE WEST COAST NEAR THE END OF THE FIRST FULL WEEK OF JUNE...RESULTING IN A SHARP INCREASE IN TEMPERATURES ON FRIDAY JUNE 7...MAINLY FOR INLAND AREAS. THE HEAT THEN CONTINUED ACROSS INLAND AREAS THROUGH SATURDAY THE 8TH. SOME OF THE WARMEST INLAND VALLEY LOCATIONS SAW THEIR TEMPERATURES CLIMB PAST 100 ON THESE TWO DAYS. LIVERMORE SET DAILY HIGH TEMPERATURE RECORDS ON BOTH THE 7TH AND 8TH. A SHALLOW MARINE LAYER AND LIGHT ONSHORE FLOW MAINTAINED COOL CONDITIONS NEAR THE COAST AND RESULTED IN SOME VERY LARGE TEMPERATURE GRADIENTS ACROSS THE REGION. FOR INSTANCE...ON JUNE 8 THE HIGH TEMPERATURE IN SAN FRANCISCO WAS ONLY 62 DEGREES...45 DEGREES COOLER THAN THE BLISTERING 107 DEGREE HIGH REPORTED A MERE 35 MILES TO THE EAST IN LIVERMORE.

ONCE THE UPPER LEVEL RIDGE BEGAN TO WEAKEN ON JUNE 9...AN UPPER LEVEL LOW OFF THE SOUTHERN CALIFORNIA COAST BEGAN TO LIFT TO THE NORTH. BY LATE ON THE NIGHT OF SUNDAY JUNE 9 THE LOW TRACKED ACROSS THE CENTRAL CALIFORNIA COAST AND TRIGGERED WIDESPREAD THUNDERSTORM ACTIVITY ACROSS NORTHERN CALIFORNIA. PART OF THAT ACTIVITY INCLUDED AN AREA OF HIGH-BASED THUNDERSTORMS THAT RUMBLED ACROSS THE NORTH BAY DURING THE EARLY MORNING HOURS OF MONDAY JUNE 10. ROUGHLY 400 CLOUD TO GROUND LIGHTNING STRIKES WERE DETECTED ACROSS SONOMA AND NAPA COUNTIES AND ADJOINING COASTAL WATERS EARLY THAT MONDAY MORNING...MAINLY BETWEEN 12:30 AM AND 3:00 AM. THESE STORMS WERE CLASSIFIED AS "DRY" THUNDERSTORMS BECAUSE THEY DROPPED LESS THAN A TENTH OF AN INCH OF RAIN IN MOST LOCATIONS. LIGHTNING FROM THESE STORMS IGNITED ABOUT 20 WILDFIRES ACROSS SONOMA COUNTY. FORTUNATELY...ALL OF THESE BLAZES WERE CONTROLLED QUICKLY AND DID NOT DAMAGE ANY HOMES OR OTHER STRUCTURES. A FEW LIGHTNING STRIKES ALSO OCCURRED ACROSS EASTERN ALAMEDA AND CONTRA COSTA COUNTIES EARLY ON THE MORNING OF THE 10TH.

DURING MOST OF THE MIDDLE THIRD OF JUNE A WEAK UPPER LEVEL TROUGH PERSISTED NEAR THE WEST COAST. THIS RESULTED IN RELATIVELY COOL CONDITIONS ACROSS THE REGION. A BRIEF SINGLE DAY WARM-UP OCCURRED ON THE 14TH...OTHERWISE TEMPERATURES WERE CONSISTENTLY BELOW NORMAL FROM THE 11TH THROUGH THE 20TH.

BY LATE IN THE THIRD WEEK OF JUNE...SATELLITE DATA INDICATED THAT A PLUME OF VERY MOIST AIR WAS MOVING ACROSS THE PACIFIC. NUMERICAL WEATHER PREDICTION MODELS INDICATED THAT THIS MOIST PLUME OF AIR WOULD EVENTUALLY REACH THE WEST COAST AND BY SUNDAY JUNE 23RD THE MOISTURE HAD ARRIVED ALONG THE CALIFORNIA COAST. SATELLITE MEASUREMENTS INDICATED THAT THE MOISTURE CONTENT IN THIS PLUME WAS BETWEEN 200-300% OF NORMAL FOR JUNE. BY LATE ON THE 23RD RAIN BEGAN TO FALL ACROSS THE NORTH BAY. OVER THE NEXT 48 HOURS MOISTURE CONTINUED TO STREAM INLAND. RAINFALL INTENSITY INCREASED ACROSS THE NORTH BAY BY THE EARLY MORNING HOURS OF TUESDAY JUNE 25

AS THE MOISTURE PLUME INTERACTED WITH LIFT PRODUCED BY AN INCOMING SHORTWAVE UPPER LEVEL TROUGH. THE BULK OF THE RAIN FELL BETWEEN 1 AM AND 4 PM ON THE 25TH. OROGRAPHIC LIFT ENHANCED PRECIPITATION IN THE COASTAL MOUNTAINS OF THE NORTH BAY. RAINFALL TAPERED OFF LATE ON THE 25TH. BY THEN RAINFALL TOTALS WERE VERY IMPRESSIVE FOR LATE JUNE...AND ALSO RECORD-BREAKING. OVER FIVE INCHES OF RAIN FELL ON MOUNT TAMALPAIS IN MARIN COUNTY AND ALSO NEAR CAZADERO IN SONOMA COUNTY.

OROGRAPHIC ENHANCEMENT AND RAIN SHADOW EFFECTS RESULTED IN LARGE PRECIPITATION GRADIENTS WITH THE JUNE 25TH EVENT. FOR EXAMPLE...RAINFALL ON MOUNT TAMALPAIS WAS MORE THAN 10 TIMES GREATER THAN WHAT FELL IN SAN RAFAEL JUST FIVE MILES TO THE NORTHEAST. IN ADDITION...THE MOST SIGNIFICANT MOISTURE AND LIFT WAS CONFINED TO THE NORTH BAY AND SO RAIN TOTALS DROPPED OFF SHARPLY SOUTH OF THE GOLDEN GATE.

RAINFALL ON JUNE 25 EASILY BROKE RAINFALL RECORDS FOR THE DATE. FOR EXAMPLE...1.38 INCHES OF RAIN IN KENTFIELD ON THE 25TH FAR EXCEEDED THE PREVIOUS RECORD OF 0.02 INCHES.

RAINFALL TOTALS FOR SELECT LOCATIONS DURING THIS RAIN EVENT ARE LISTED BELOW:

LOCATION	RAIN TOTALS JUNE 23-25
CAZADERO.....	5.92 INCHES
MOUNT TAMALPAIS (MIDDLE PEAK RAWS)....	5.20
OCCIDENTAL.....	3.55
SEBASTOPOL.....	2.47
VALLEY FORD.....	2.45
SEA RANCH.....	1.85
WOODACRE RAWS.....	1.75
MOUNT SAINT HELENA.....	1.73
KENTFIELD.....	1.45
SANTA ROSA.....	1.42
VENADO.....	1.40
SONOMA COUNTY AIRPORT.....	1.38
CLOVERDALE.....	1.30
ANGWIN.....	1.13
BARNABY RAWS.....	0.96
SAINT HELENA.....	0.86
CALISTOGA.....	0.75
RICHMOND.....	0.70
NAPA.....	0.68
SONOMA.....	0.60
PETALUMA.....	0.53
SAN RAFAEL.....	0.43
HALF MOON BAY.....	0.35
BEN LOMOND RAWS.....	0.31
MOUNT DIABLO JUNCTION.....	0.28
OAKLAND.....	0.22
NAPA AIRPORT.....	0.19
OAKLAND AIRPORT.....	0.19
SAN FRANCISCO.....	0.15
SAN JOSE.....	0.04

BECAUSE OF THIS ANOMALOUS RAIN EVENT...MONTHLY RAIN TOTALS ACROSS MOST OF THE NORTH BAY WERE WELL ABOVE NORMAL...MORE THAN 600 PERCENT OF NORMAL AT THE SONOMA COUNTY AIRPORT AND MORE THAN 900 PERCENT OF NORMAL AT OCCIDENTAL. NORTHERN SECTIONS OF THE EAST BAY AS WELL AS COASTAL PORTIONS OF THE SAN FRANCISCO PENINSULA ALSO ACCUMULATED GREATER THAN NORMAL RAINFALL IN JUNE...BUT IN LESS SPECTACULAR FASHION COMPARED TO THE NORTH BAY. ALL OTHER CLIMATE STATIONS RECEIVED BELOW NORMAL RAINFALL IN JUNE.

NOTE: THE 2012-2013 RAIN YEAR SUMMARY WILL BE ISSUED IN A PUBLIC INFORMATION STATEMENT LATER THIS WEEK.

THE FINAL NOTABLE WEATHER EVENT IN JUNE WAS THE HEAT WAVE THAT BEGAN DURING THE FINAL FEW DAYS OF THE MONTH. FOUR DAILY HIGH TEMPERATURE RECORDS WERE BROKEN ON THE 29TH AND 30TH. THIS HEAT WAVE...WHICH WOULD ULTIMATELY PERSIST THROUGH JULY 4TH...WAS MUCH LIKE THE ONE EARLIER IN JUNE IN THAT THE MOST SIGNIFICANT HEAT OCCURRED IN THE HILLS AND INLAND VALLEYS WHILE COASTAL AREAS AND COASTAL VALLEYS REMAINED RELATIVELY MILD.

AVERAGE TEMPERATURES DURING JUNE WERE SLIGHTLY WARMER THAN NORMAL AT MOST CLIMATE STATIONS. THE RECORD-SETTING WARMTH ON JUNE 7-8 AND AGAIN ON JUNE 29-30 MORE THAN OFFSET THE COOLER THAN NORMAL MIDDLE THIRD OF THE MONTH.

# ...JUNE REGIONAL TEMPERATURE SUMMARY...

LOCATION	DEPARTURE			DEPARTURE		
	AVG HIGH	NORMAL HIGH	FROM NORMAL	AVG LOW	NORMAL LOW	FROM NORMAL
NORTH BAY...						
ANGWIN	80.6	80.8	-0.2	52.7	51.5	1.2
CALISTOGA	88.9	85.9	3.0	50.4	50.4	0.0
CLOVERDALE	89.4	87.5	1.9	55.3	55.3	-0.2
KENTFIELD	80.9	79.1	1.8	53.2	51.9	1.3
NAPA	83.7	81.1	2.6	54.3	53.4	0.9
NAPA AIRPORT	80.3	78.4	1.9	52.3	49.9	2.4
OCCIDENTAL	76.6	76.0	0.6	52.1	50.9	1.2
PETALUMA AIRPORT	79.6	78.6	1.0	52.0	50.6	1.4
SAN RAFAEL	79.7	75.8	3.9	55.5	53.4	2.1
SONOMA COUNTY AP	81.9	81.2	0.7	51.8	50.0	1.8
SONOMA	82.1	83.1	-1.0	52.2	51.0	1.2

# SAN FRANCISCO PENINSULA...

HALF MOON BAY	65.1	63.5	1.6	50.1	49.2	0.9
REDWOOD CITY	80.2	79.2	1.0	55.5	53.5	2.0
SAN FRANCISCO AIRPORT	70.8	70.6	0.2	54.6	53.8	0.8
SAN FRANCISCO DOWNTOWN	67.0	66.4	0.6	53.8	52.8	1.0

# EAST BAY...

CONCORD AIRPORT	83.7	82.6	1.1	56.3	55.9	0.4
FREMONT	77.5	75.4	2.1	55.5	54.8	0.7
HAYWARD AIRPORT	73.6	71.9	1.7	56.4	55.2	1.2
LIVERMORE	86.8	83.3	3.5	55.3	54.2	1.1
LIVERMORE AP	85.6	81.1	4.5	56.2	54.1	2.1
MOUNT DIABLO JUNCTION	78.6	77.6	1.0	55.1	54.3	0.8
OAKLAND	73.5	71.5	2.0	56.0	55.0	1.0
OAKLAND AIRPORT	72.8	70.5	2.3	55.0	53.8	1.2

SOUTH BAY AND SANTA CRUZ COUNTY...

MOFFETT FIELD	77.3	76.2	1.1	57.9	56.6	1.3
SAN JOSE	79.1	79.1	0.0	56.7	56.0	0.7
SANTA CRUZ	76.4	74.7	1.7	52.7	51.8	0.9
WATSONVILLE	72.6	71.3	1.3	53.3	51.7	1.6
WATSONVILLE AP	72.7	73.1	-0.4	51.6	50.7	0.9

MONTEREY AND SAN BENITO COUNTIES...

CARMEL VALLEY	79.9	76.4	3.5	50.0	48.7	1.3
HOLLISTER	79.6	79.1	0.5	53.1	50.9	2.2
MONTEREY	66.3	64.9	1.4	53.0	50.3	2.7
MONTEREY AIRPORT	67.9	66.7	1.2	53.7	52.0	1.7
SALINAS AIRPORT	70.4	70.2	0.2	54.2	53.1	1.1

...JUNE REGIONAL PRECIPITATION SUMMARY...

LOCATION	JUN TOTAL	NORMAL JUN PRECIP	PERCENT OF NORMAL
----------	--------------	-------------------------	----------------------

NORTH BAY...

ANGWIN	1.17	0.29	403
CALISTOGA	0.75	0.22	341
CLOVERDALE	1.30	0.16	813
KENTFIELD	1.49	0.25	596
NAPA	0.68	0.19	358
NAPA AIRPORT	0.19	0.19	100
OCCIDENTAL	3.74	0.41	912
PETALUMA AIRPORT	0.56	0.17	329
SAN RAFAEL	0.43	0.14	307
SONOMA COUNTY AP	1.50	0.24	625
SONOMA	0.60	0.19	316

SAN FRANCISCO PENINSULA...

HALF MOON BAY	0.54	0.29	186
REDWOOD CITY	0.03	0.10	30
SAN FRANCISCO AIRPORT	0.05	0.11	45
SAN FRANCISCO DOWNTOWN	0.15	0.16	94

EAST BAY...

CONCORD AIRPORT	0.12	0.09	133
FREMONT	0.02	0.10	20
HAYWARD AIRPORT	0.01	0.20	5
LIVERMORE	0.04	0.09	44
LIVERMORE AIRPORT	0.04	0.04	100
MOUNT DIABLO			
JUNCTION	0.28	0.19	147
OAKLAND	0.22	0.12	183
OAKLAND AIRPORT	0.17	0.18	94
RICHMOND	0.70	0.20	350

SOUTH BAY AND SANTA CRUZ COUNTY...

BEN LOMOND	0.88	0.23	35
GILROY	0.02	0.11	18
MOFFETT FIELD	0.03	0.10	30
SAN JOSE	0.04	0.10	40
SANTA CRUZ	0.16	0.19	84
WATSONVILLE	0.03	0.11	27
WATSONVILLE AP	0.05	0.12	42

MONTEREY AND SAN BENITO COUNTIES...

CARMEL VALLEY	0.00	0.13	0
HOLLISTER	0.00	0.07	0
MONTEREY	0.06	0.20	30
MONTEREY AIRPORT	0.04	0.10	40
SALINAS AIRPORT	0.04	0.09	44

...DAILY TEMPERATURE RECORDS FOR JUNE 2013...

	LOCATION	RECORD MAXIMUM TEMP	PREVIOUS RECORD
6/07	LIVERMORE	102	101 IN 1973
6/08	LIVERMORE	107	106 IN 1918
6/29	OAKLAND	85	81 IN 1991
6/29	MOFFETT FEDERAL AIRFIELD	92	91 IN 1950
6/29	MONTEREY	84	80 IN 1996
6/30	GILROY	100	98 IN 1999

	LOCATION	RECORD MINIMUM TEMP	PREVIOUS RECORD
--	----------	---------------------------	--------------------

6/21 OAKLAND AIRPORT

49

50 IN 2012

...MONTHLY RANKS FOR DOWNTOWN SAN FRANCISCO...

AVERAGE HIGH TEMPERATURE.....67.0.....46TH WARMEST OUT OF 139 YEARS  
AVERAGE LOW TEMPERATURE.....53.8.....29TH WARMEST OUT OF 139 YEARS  
PRECIPITATION..... 0.15 IN.....38TH WETTEST OUT OF 164 YEARS

...MONTHLY EXTREMES FOR SELECT LOCATIONS...

LOCATION	WARMEST DAY(S)	COOLEST DAY(S)	WETTEST DAY(S)
SANTA ROSA AIRPORT	6/29 102 DEG	6/12 42 DEG	6/25 1.14 IN
SAN FRANCISCO	6/29 77 DEG	5 DAYS 51 DEG	6/25 0.12 IN
LIVERMORE AIRPORT	6/08 107 DEG	6/13 6/19 50 DEG	6/24 0.03 IN
SAN JOSE	6/29 96 DEG	6/13 51 DEG	6/24 0.04 IN
SALINAS AIRPORT	6/28 6/29 82 DEG	6/14 47 DEG	6/24 0.04 IN

NOTE: THIS CLIMATOLOGICAL DATA IS PRELIMINARY. FOR OFFICIAL  
CERTIFIED CLIMATOLOGICAL DATA PLEASE CONTACT THE NATIONAL  
CLIMATIC DATA CENTER AT 828-271-4800 OR [HTTP://WWW.NCDC.NOAA.GOV](http://www.ncdc.noaa.gov).  
OFFICIAL VALUES AS DETERMINED AT THE ABOVE WEB SITE MAY TAKE  
SEVERAL MONTHS FOR AUTHENTICATION AND PUBLICATION.

\$\$

DYKEMA